INTRAOCULAR LENS

BACKGROUND OF THE INVENTION

The present invention relates to an intraocular lens which is adapted to be seated in the eye, for example, in the anterior chamber, the posterior chamber or partly in the anterior chamber and partly in the posterior chamber, after the removal of a natural lens.

It has been found that the insertion of an introcular lens is by far the best solution to correcting vision after cataract surgery. The proper implanation of an intraocular lens always involves the risk of damage to the eye particularly during the insertion process as well as at a later time if the intraocular lens dislocates or must be removed or replaced.

To place the lens in the eye, the surgeon ordinarily makes an incision or opening in the cornea which aligns with the pupil, and the surgeon passes the lens through the opening. The position-fixation members of the lens are flexible and can be bent to pass through the opening. Accordingly, the minimum length of the opening which must be made is ordinarily determined by the diameter of the lens body, or optic, which ordinarily has a circular periphery and which is substantially rigid, being formed of a material such as, for example, polymethylmethacrylate and having a configuration which provides the desired optical characteristics. It is, of course, desirable to make the opening in the cornea as small as possible to minimize the risk of damage to the eye.

In my copending patent application Ser. Nos. 575,018 and 612,584 are disclosed lenses which I have developed which utilize a miniature optic, for example an optic which is only about 3 mm in diameter, in conjunction with a frame or side members which are opaque, so as to prevent the glare which would otherwise result from use of such miniature optic alone.

SUMMARY OF THE INVENTION

It is an object of the present invention, therefore, to provide a new and improved intraocular lens which avoids one or more of the disadvantages of prior such lenses.

It is another object of the invention to provide a new and improved intraocular lens which can be inserted into the eye through a smaller opening than was heretofore required.

It is another object of the invention to provide a new and improved lens body for an intraocular lens, which lens body can be inserted into the eye through a smaller opening than was heretofore required.

In accordance with the invention, an intraocular lens comprises a medial light-focussing lens body comprised of a plurality of detachably connected portions each of which individually exhibits a dimension substantially smaller than the minimum length dimension of the opening in the eye which would be required for insertion therethrough of the assembled lens body so that such individual portions can be inserted into the eye, when the lens body is disassembled, through a smaller opening in the eye than the opening through which the lens body as a whole could be inserted when assembled. The lens body includes magnet means on said portions for detachably connecting said portions to each other and is capable of being assembled within the eye after insertion of the individual portions into the eye. The lens also includes position-fixation means extending from different peripheral regions of the lens body and adapted to seat within an eye for fixing the position of the lens body within the eye.

In accordance with one embodiment of the invention, the plurality of separable portions are a central optic portion for focusing light and a pair of substantially opaque side portions for preventing glare. The optic portion is of miniature size, i.e. having a dimension which permits its insertion through an opening in the eye substantially smaller than 5 mm in length.

Also in accordance with the invention, a lens body for an intraocular lens and adapted for insertion into the eye through an opening therein comprises a plurality of separate portions held in an initial relation by a magnet means connecting the plurality of portions. The lens body portions may be individually inserted into the eye through said opening therein and may be assembled together within the eye. The magnet means is capable of holding the plurality of portions substantially in their initial relation after they are assembled together.

For a better understanding of the present invention, together with other and further objects thereof, reference is made to the following description taken in connection with the accompanying drawings, and its scope will be pointed out in the appended claims.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a plan view of an embodiment of the present invention intended for fixation in, for example, the posterior chamber of the eye;

FIG. **2** is a plan view of the FIG. **1** lens with the individual lens body portions thereof separated prior to insertion in the eye;

FIG. **3** is a side elevational view of the FIG. **1** lens fixed within an eye, shown in section;

FIG. **4** is a side elevational view of the lens body of the present invention taken along line **4—4** of FIG. **2**;

FIG. **5** is a plan view of a lens body according to another embodiment of the present invention;

FIG. **6** is an enlarged, perspective view of a magnet member according to one embodiment of the present invention;

FIG. **7** is a fragmentary, enlarged view taken along line **7—7** of FIG. **1**; and

FIG. **8** is a fragmentary, enlarged view taken along line **8—8** of FIG. **5**.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

With reference to the drawings, the invention as a whole is depicted in the figures and denoted by reference character **10**. The intraocular lens structure **10** includes as one of its elements a medial lens body **12**, FIG. **1**. The lens body **12** includes a light focusing central portion **61** which may be constructed of any biologically inert, transparent material suitable for optical correction such as, for example, polymethylmethacrylate and a pair of side portions **60** and **62** which may be constructed of the same or any other biologically inert material but which are substantially opaque.

Lens structure **10** is intended for insertion and fixation within an eye **30**, after cataract removal. Eye **30** includes a cornea **31**, an anterior chamber **33**, a posterior chamber **34** and an iris **35**. FIG. **3** shows eye **30** after an extracapsular surgical procedure in which, after the natural lens has been removed, the posterior capsule **36**, as well as a small part of anterior capsule **36*a*** remains. Ciliary sulcus **38** of the posterior chamber is